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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/342,210 06/29/99 KOHNO

M 684.2861

005514
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MMC2/0523

EXAMINER

CARIASO, A

ART UNIT

PAPER NUMBER

2875

DATE MAILED:

05/23/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/342,210

Applicant(s)

KOHNO, MICHIO

Examiner

Alan Cariaso

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2875

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 March 2001.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☒ The proposed drawing correction filed on 13 March 2001 is: a) ☒ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____.

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DETAILED ACTION

Response to Amendment

Drawings

1. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on March 13, 2001 have been approved.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

3. Claims 1-6, 8, 9, 11-16, 18, and 20-28 are rejected under 35 U.S.C. 102(e) as being anticipated by NAGAYAMA (US 5,797,674).
4. NAGAYAMA discloses an Hg light source (300); converting optical systems being/including any of an elliptical mirror (301), first and second lenses (302, 312) forming a light source image (col. 1, lines 32-34) which is a luminous intensity distribution formed at a predetermined plane of the incident end of a total reflection type light transmitting element or fiber bundle (303, 200, 153), and alternative to the fiber bundle (303) is a fly-eye lens and lens unit (figs. 24, 25); an exposure apparatus

transferring a pattern of a mask onto a wafer (128, 4) and development thereof (col. 1, lines 39-49; cols. 12-19) at the final illumination field.

5. As for the recitations in claims 22 and 24 that reads "for use in an exposure apparatus for illuminating a mask having a pattern formed thereon and for protecting the pattern onto a substrate by projection exposure", "for converting a luminous intensity distribution of plural light fluxes (supplied by a plurality of laser light sources) having different incidence angles", and "for defining an illumination region upon the mask by use of light from said light transmitting element", any recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

6. Claims 1-3, 5, 9, 11-13, 15, 20, 22, 23, 25-28 are rejected under 35 U.S.C. 102(b) as being anticipated by OHTA (US 4,497,013).

7. OHTA (see figures 4 and 6; cols 1-2 and 5-6).

8. Claims 1-4, 9, 11-14, 20-23, 27, 28 are rejected under 35 U.S.C. 102(b) as being anticipated by FORKNER et al (US 5,559,911).

9. FORKNER (see fig. 13, fig. 8; col. 6, lines 49-64, col. 7, lines 36-60) .

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 7 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over FORKNER et al (US 5,559,911) in view of RYKOWSKI et al (US 5,706,376).

12. FORKNER discloses applicant's invention except the converting optical system being an optical rod and lens unit as claimed. RYKOWSKI (fig. 1) teaches the use of a optical rod (28) and lens (34, 36) unit for the purpose of directing light into at least one optical fiber (40). It would have been obvious to one having ordinary skill in the art at the time of applicant's invention to modify the illumination optical system of FORKNER et al to include the type of optical rod and lens unit as taught by RYKOWSKI et al in order to convert an illuminance distribution (52) of a light source image (12) into a luminous intensity distribution upon a predetermined plane (46) at an entrance area of a fiber optic.

13. Claims 10 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over NAGAYAMA (US 5,797,674) in view of MARKLE (US 4,530,565).

14. NAGAYAMA discloses applicant's invention except the light transmitting element having a square cross-sectional entrance end and an arcuate-shaped cross-sectional

exit end. MARKLE teaches the optic systems used in microlithography including the use of an optic fiber bundle (10) having a square cross-sectional entrance end (30) and an arcuate-shaped cross-sectional exit end (32) for the purpose of outputting uniformly illuminated arcuate shaped beam of light. It would have been obvious to one having ordinary skill in the art at the time of applicant's invention to modify the illumination optical/exposure system of NAGAYAMA to include the type of shaped optic fiber bundle as taught by MARKLE to output uniformly illuminated light of arcuate shape in microlithographic processes.

Response to Arguments

15. Applicant's arguments filed March 13, 2001 have been fully considered but they are not persuasive.

16. In regard to claims anticipated by NAGAYAMA, applicant states that NAGAYAMA does not serve to place the lamp image and the predetermined plane in an optical Fourier transform relation, that the illuminance distribution of the lamp image formed at the focal point of the elliptical mirror 301 would not transformed to a luminous intensity distribution at the incident end of the optical fiber 303, that the lens system 302 of NAGAYAMA would not correspond to the luminous intensity distribution converting optical system of applicant's invention. In rebuttal, applicant's claimed limitations of a "luminous intensity distribution" and "luminous intensity distribution converting optical system" which produces this distribution upon "a predetermined plane" as claimed, are not limited to any particular luminous intensity distributions not met by NAGAYAMA. No mention of and/or structure that supports the intended distribution of a Fourier transform

relation is claimed, and therefore no support is given to applicant's argument.

NAGAYAMA adequately meets applicant's claims by disclosing at least converting optical systems including first and second lenses (302, 312) converting light from the Hg lamp to form a lamp image (col. 1, lines 32-34) which is generally a luminous intensity distribution formed at a predetermined plane of the incident end of a total reflection type light transmitting element or fiber bundle (303, 200, 153).

17. Applicant states, in regard to OHTA, that the lamp image and the predetermined plane (i.e., the light entrance surface of the multi-beam forming optical element 5') are placed at the same position, that it is evident that the condenser lens systems 22 or 23 do not function to convert an illuminance distribution of the lamp image to a luminous intensity distribution on a predetermined plane. In rebuttal, OHTA's converting optical system (22,3',7',23) brings lamp image towards an incident plane (a) as some form of inherent luminous intensity distribution. No features of this converting optical system and the resultant luminous intensity distribution are claimed that are not met by the optical illumination system of OHTA.

18. Applicant states that the elliptical mirror of FORKNER et al. does not function to convert an illuminance distribution of the lamp image to a luminous intensity distribution on a predetermined plane and therefore does not correspond to the claimed luminous intensity distribution converting optical system as recited in applicant's claims 1 and 11. Examiner notes that applicant discusses the intended distinctness between the illuminance distribution of the lamp image and the optics-converted luminous intensity distribution of the lamp image. However, given the claims presentation of these

limitations and lack of any distinguishing features of the distributions and/or structure to support the intended function, applicant's claims are broadly interpreted to be met by FORKNER et al.

19. In regards to amended claim 22 and depending claim 24, the amendment that involves the mask recitation is not considered adequate structure to support the intended function of the parts or entire optical illumination system. Claims 22 and 24 are remain anticipated by NAGAYAMA. Examiner disagrees on applicant's argument that OHTA does not provide luminance intensity distribution converting optical system affective to convert the luminous intensity distribution of plural light fluxes to an illuminance distribution on the light entrance surface of a total reflection type light transmitting element because there is no total reflection type light transmitting element after this multi-beam forming optical element 5 of OHTA. OHTA supports a the use of total reflection type light transmitting element on column 6, line 14-17. Therefore, OHTA still meets the limitation of amended claim 22.

Conclusion

20. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the


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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan Cariaso whose telephone number is (703) 308-1952. The examiner can normally be reached on M-F (9:00-5:00 PM) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (703) 305-4939. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7724 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.


Alan Cariaso
Primary Examiner
Art Unit 2875

AC
May 21, 2001